Table of Contents
Exhibit Six

Exhibit 6 : REPORT OF MEASUREMENTS

Section 6.00 : Introduction

(a) Test Facility Qualifications
Compliance Test Laboratories, Inc. (CTL) has achieved the following listing/accreditations given below.

Federal Communications Commissions (FCC)
The CTL test facility is listed by the FCC, reference number 31040/PRV – 1300F2, as being a site from which the FCC will accept radiated and conducted emissions data for FCC Class B certification.

National Institute of Standards and Technology (NAVLAP)
The CTL test facility has achieved NAVLAP accreditation in the area of radiated and conducted emissions as specified below:

- International Special Committee on Radio Interference (CISPR)
  12/CIS22 : IEC/CISPR 22: 1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment.
- FCC Methods
  (a) 12/F01 : FCC Method – 47 CFR Part 15 – Digital Devices
  (b) 12/F01a : Conducted Emissions, Power Lines, 450 kHz to 30 MHz
  (c) 12/F01b : Radiated Emissions
- Australian Standards referred to by clauses in AUSTEL Technical Standards
  (a) 12/T50 : AS/NZS 3260: Safety of ITE including Electrical Business Equipment
  (b) 12/T51 : AS/NZS 3548: Electromagnetic Interference

Test Results Tractability
CTL personnel performed all testing. All measurements are traceable to NIST as measurements were made using:

- Calibrated test site w/procedures in accordance with ANSI 63.4 1992
- Calibrated measuring instruments traceable to NIST

(b) Standards Referenced

Standards Applicable to EUT

- ANSI, *Methods of Measurement of Radio-Noise Emissions form Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz*, C63.4 (1992).
- Title 47 CFR Part 15*, Radio Frequency Devices*
  - Subpart C*: Intentional Radiators* (October 1, 1997).

Standards Applicable to Measurement Procedures

- *CISPR Specifications for Radio Interference Measuring Apparatus and Measurement Methods*, CISPR Publication 16, 2nd Edition (1996).

(c) Electromagnetic Emissions Test Results Summary

(i) Conducted Emissions - **Passed with a 9.6dB Margin**

The conducted electromagnetic emissions amplitudes were measured from the EUT at the CTL, Inc. electromagnetic measurement laboratory on May 21, 1998. The test results confirm that the amplitudes of the conducted emissions from the EUT comply with FCC Part 15 Subpart C limits**. The smallest margin measured was 9.6dB (0.98MHz) and complies with FCC Part 15 Subpart C limits when CTL's measurement of uncertainty of 2.9dB is taken into consideration.**

(ii) Unintentional Electric-Field Radiated Emissions - **Passed with a 12.4dB Margin**

The conducted electromagnetic emissions amplitudes were measured from the EUT at the CTL, Inc. electromagnetic measurement laboratory on May 21, 1998. The test results confirm that the amplitudes of the unintentional electric-field emissions from the EUT comply with FCC Part 15 Subpart C limits. **The smallest margin measured was 12.4 dB (951.76MHz) and complies with FCC Part 15 Subpart C limits when CTL's measurement of uncertainty of 2.56dB is taken into consideration.**

(iii) Intentional Microwave Radiated Emissions - **Passed**

The microwave radiated electromagnetic emissions amplitudes were measured at the CTL, Inc. electromagnetic measurement laboratory on May 21, 1998. The test results confirm that the amplitudes of the intentional microwave radiated emissions from the EUT comply with FCC Part 15 Subpart C limits.

Section 6.01 : Equipment-Under Test

(a) EUT Description

The Equipment Under Test (EUT) is the Schlumberger Centron Electricity Meter as described below:

- Manufacturer : Schlumberger Electricity
- Model Number : Centron® with RMR.
- Serial Number : 14915930

(b) Support Equipment / Cables

(i) RF Transparent Test Fixture

- Manufacturer : Schlumberger Electricity
- Model Number : N/A. Unique Fixture designed specifically for EMI testing.
- Serial Number : N/A

(ii) I/O Cables

None

(c) Mode of Operation

- The EUT was operating in its normal operating mode, as specified in §2.2 of this document, during conducted and unintentional radiated emissions testing.
- During intentional microwave radiated emissions testing, to facilitate easier and more accurate data acquisition, the EUT was modified to transmit continuously.

(d) EMC Design Modifications

The EUT proved to be in compliance with applicable FCC regulations without the need for EMC design modifications.

Section 6.02 : Test Procedure

(a) In General

The test procedures used in determining compliance with applicable FCC regulations were in accordance with applicable FCC test procedure requirements, and more specifically, with ANSI C63.4.[1] All measurements were performed using the peak, CISPR quasi-peak, or average detector function of the test receiver or spectrum analyzer. The detector bandwidths were as follows:

1. Frequencies Range - 10kHz to 150kHz
   - Quasi-Peak : 200 Hz
   - Peak : 200 Hz
   - Average : 200 Hz
2. Frequency Range - 150kHz to 30kHz
   - Quasi-Peak : 9 kHz
   - Peak : 10 kHz
   - Average : 10 kHz
3. Frequency Range - 30MHz to 1GHz
   - Quasi-Peak : 120 kHz
   - Peak : 100 kHz
   - Average : 100 kHz
4. Frequency Range - > 1GHz
   - Quasi-Peak : N/A
   - Peak : 1 MHz
   - Average : 1 MHz

(b) Conducted Electromagnetic Emissions

The conducted emission amplitudes were measured between 450kHz and 30MHz on the hot and neutral sides of the ac power lines of the EUT. These measurements were acquired utilizing a 50□/50uH LISN and a Rohde & Schwarz ESH3 receiver.

The measurements are taken by a computer program implementing the following procedures:

(1) Set Detection Mode to Peak detection with 10kHz bandwidth;
(2) Scan receiver from 450kHz to 30MHz using a 10kHz step size;
(3) Record Peak emission amplitude for each frequency;
(4) Plot Peak Values;
(5) Set Detection Mode to CISPR detection with 9kHz bandwidth;
(6) Record CISPR amplitude value for each frequency with a PEAK margin of less than 10dB;
(7) Set Detection Mode to Average detection with a 10kHz bandwidth;
(8) Record Average amplitude values for each frequency with a CISPR margin of less than 6dB;
(9) Generate Test Report presenting test results.

---

[1] ANSI, *Methods of Measurement of Radio-Noise Emissions form Low-Voltage Electrical Equipment in the Range of 9kHz to 40GHz*, C63.4 (1992).

(i) Calculations

The calculation process for conducted emissions is as follows:

(1) Margin (dB) = Applicable Limit (dB) - Voltage (dB)

(2) Voltage (dB) = Meter Reading (dBuV) + Loss (dB) - Gain (dB)
- Loss = Cable Loss (dB) + Probe Factor (dB) + Attenuation (dB)
- Gain = Amplifier Gain (dB)

EXAMPLE CALCULATION

Frequency: 10 MHz
- Meter Reading = 25 (dBuV)
- Cable Loss = 0 (dB)
- Probe Factor = 0 (dB)
- Attenuation = 10 (dB) [10 dB transient limiter in signal path]
- Amplifier Gain = 0 (dB) [no amplifier in signal path]
- Applicable Limit = 48 (dB)

Margin (dB) = 48 (dB) - [25 (dBuV) +10 (dB)] = 13 dB

(ii) Test Equipment Description & Calibration Information

The table below list the test equipment used to obtain the data for conducted emissions.

DESCRIPTION	MANUFACTURER	MODEL	CAL DUE	START FREQUENCY	STOP FREQUENCY
RECEIVER	ROHDE & SCHWARZ	ESH3	07-18-98	9 kHz	30 MHz
LISN	SCHWARZBECH	NNLA 8120	07-18-98	0 Hz	30 MHz
Transient Limiter	Chase	CFL 9206	01-10-99	9 kHz	30 MHz

(iii) Conducted Emission Measured Data

Test Date : May 21, 1998
Test Performed : Conducted Emissions
Limit Values : **FCC Class B Limits (Quasi-Peak)**

EUT DESCRIPTION

(1) Centron RMR Power Meter
(2) Unit Serial Number: 14915930
(3) Input Voltage: 120 Volts a.c. 60 Hz

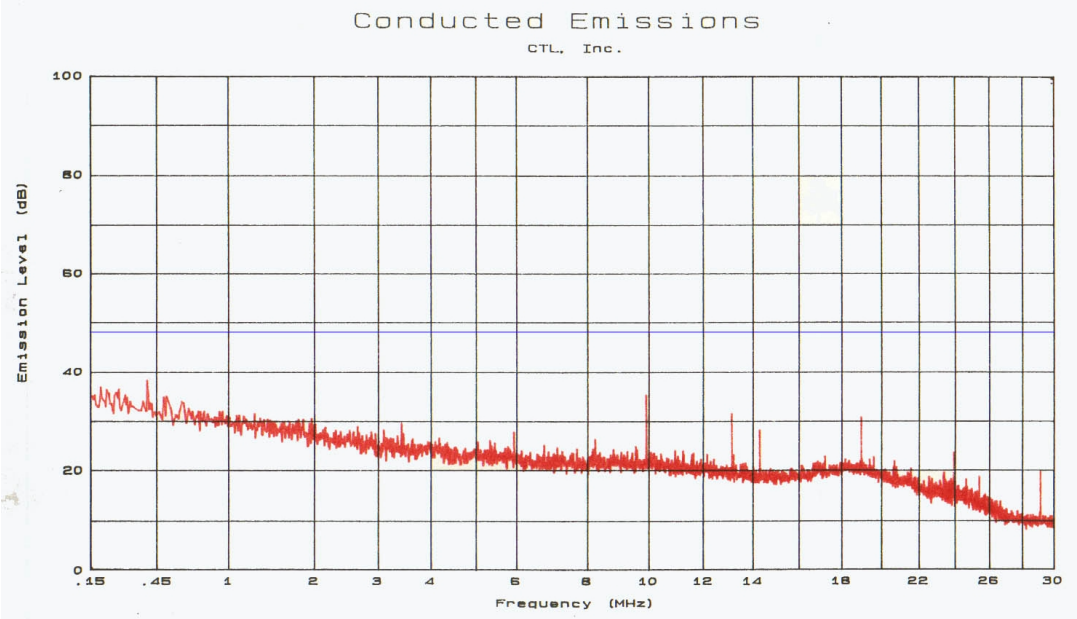
FCC Class B : Quasi-Peak Limits / Receiver Detection Mode : Peak

Frequency (MHz)	Limit (dB)	Neutral Emission (dB)	Neutral Margin (dB)	Frequency (MHz)	Limit (dB)	Line Emission (dB)	Line Margin (dB)
0.45	48.0	34.8	13.2	0.47	48.0	36.7	11.3
0.46	48.0	35.1	12.9	***0.48***	***48.0***	***37.6***	***10.4***
0.48	48.0	35.3	12.7	0.49	48.0	35.2	12.8
0.53	48.0	37.0	11.0	0.50	48.0	35.2	11.5
0.54	48.0	34.5	13.5	0.51	48.0	36.5	12.9
0.58	48.0	36.5	11.5	0.52	48.0	35.1	12.6
0.59	48.0	35.6	12.4	0.55	48.0	35.4	12.8
0.60	48.0	35.5	12.5	0.56	48.0	35.2	12.8
0.65	48.0	35.3	12.7	0.59	48.0	35.2	11.2
0.66	48.0	35.8	12.2	0.60	48.0	36.8	12.4
0.67	48.0	35.7	12.3	0.67	48.0	35.6	10.6
0.68	48.0	34.5	13.5	0.69	48.0	37.4	13.0
0.69	48.0	36.6	11.4	0.70	48.0	35.0	13.2
0.75	48.0	35.3	12.7	0.76	48.0	34.8	13.2
0.77	48.0	34.8	13.2	0.96	48.0	34.8	13.4
0.98	***48.0***	***38.4***	***9.6***	0.98	48.0	34.6	11.9

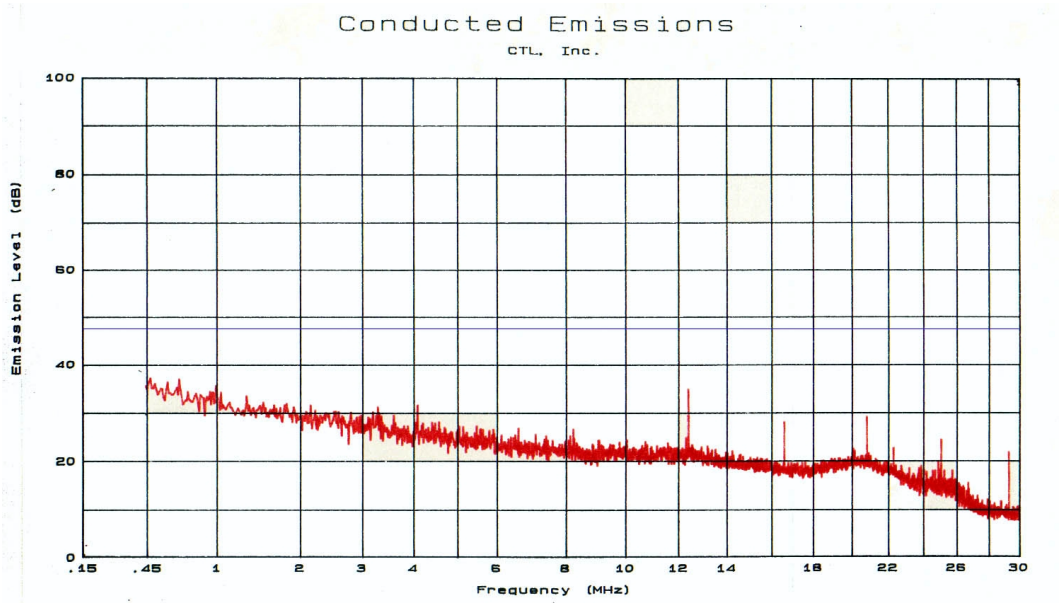
FCC Class B : Quasi-Peak Limits / Receiver Detection Mode : CISPR

Frequency (MHz)	Limit (dB)	Neutral Emission (dB)	Neutral Margin (dB)	Frequency (MHz)	Limit (dB)	Line Emission (dB)	Line Margin (dB)
0.98	48.0	34.8	13.2	0.48	48.0	35.7	12.3

(iv) Conducted Emissions - Graphical Representation of Test Data



Conducted Emission Graph - Phase : Neutral Detection Mode : Peak



Conducted Emission Graph - Phase : Line Detection Mode : Peak

(c) Unintentional Electric-Field Radiated Emissions

The electric-field radiated electromagnetic emission amplitudes were measured between 30MHz and 1GHz in CTL's three-meter semi-anechoic chamber. The EUT is setup on a RF transparent table that rests on an EMCO turntable capable of rotating from 0 to 360 degrees. Cables are oriented to maximize the field strength amplitudes. Measurements are taken via a computer program that performs the following test procedure:

1. With antenna set to a height of 1 meter, while rotating EUT, scan from 30MHz to 1GHz using PEAK detection mode and record PEAK emission values. Do again for 2, 3, and 4-meter antenna heights. Perform measurements with vertical and horizontal antenna polarizations.
2. From Step 1 above, determine the ten frequencies that have the worse PEAK margins. Measure the emissions at these frequencies again using CISPR detection mode and the proper bandwidth setting.
   (a) Tune the receiver to the frequency of interest;
   (b) Setup measurement instrumentation in proper measurement mode;
   (c) Place the antenna in the horizontal position;
   (d) Raise/Lower antenna to determine the height for maximum reception;
   (e) Rotate EUT and record the maximum emission level detected, antenna height, antenna polarization, and turntable angle;
   (f) Place the antenna in the vertical position and repeat steps (d) and (e);
   (g) Return to step (a) and repeat for each frequency of interest;
   (h) Print a report presenting the test results;

(i) Calculations

The calculation process for unintentional electric-field radiated emissions is as follows:

(1) Margin (dBuV/m) = Applicable Limit (dB) - Field Strength (dBuV)

(2) Field Strength (dBuV) = Meter Reading (dBuV) + Loss (dB) - Gain (dB)
- Loss = Cable Loss (dB) + Antenna Factor (dB) + Attenuation (dB)
- Gain = Amplifier Gain (dB)

EXAMPLE CALCULATION

Frequency: 300 MHz
- Meter Reading = 25 (dBuV)
- Cable Loss = 5 (dB)
- Antenna Factor = 10 (dB)
- Attenuation = 0 (dB) [no attenuator external to receiver]
- Amplifier Gain = 0 (dB) [no amplifier in signal path]
- Applicable Limit = 46 (dB)

Margin (dB) = 46 (dB) - [25 (dBuV) + 5 (dB) +10 (dB)] = 6 dB

(ii) Ambient Noise Level Within 6 dB of Measured EUT Emission

When the EUT is tested on the 10-meter OATS, and the measured EUT emission is less than 6dB above the ambient noise floor, either the 3-meter semi-anechoic chamber data is used or the antenna is moved closer to the EUT.

When one uses a test distance not equal to the test distance for the limit values given in the applicable regulatory standard(s), one must extrapolate the official limit to the test distance used.

For example, one can compare a 3-meter measurement to a 10-meter limit value by extrapolating the 10-meter limit to a 3-meter limit. Likewise, one can extrapolate a 10-meter limit to a 30-meter limit. This extrapolation is achieved using the following formula:

(1) Limit Correction (dB) = 20 Log (limit distance/test distance)

Using formula (1), we can determine that a 10-meter limit of 30.0 dB is theoretically equivalent to a 3-meter limit of 40.5 dB and theoretically equivalent to a 30-meter limit of 20.5 dB.

Examples

- 10-meters to 3-meters : Limit Correction (dB) = 20 Log (10m/3m) = **10.5 dB**
- 10-meters to 30-meters : Limit Correction (dB) = 20 Log (10m/30m) = **- 9.5 dB**

No extrapolation was required for the test data presented in this report.

(iii) Test Equipment Description & Calibration Information

The table below lists the instrumentation used to acquire unintentional radiated electric-field emission data:

DESCRIPTION	MANUFACTURER	MODEL	CAL DUE	START FREQUENCY	STOP FREQUENCY
3-Meter Anechoic Chamber					
RECEIVER	ROHDE & SCHWARZ	ESMI	06-30-98	20 Hz	26.5 GHz
BI-LOG ANTENNA	CHASE – S/N : 1043	CBL6111	07-18-98	20 MHz	2.0 GHz
ANTENNA MAST	EMCO	1050	N/A	N/A	N/A
TURNTABLE	MACTON		N/A	N/A	N/A
10-Meter OATS					
RECEIVER	ROHDE & SCHWARZ	ESMI	07-30-98	20 Hz	26.5 GHz
BI-LOG ANTENNA	CHASE – S/N : 1044	CBL6111	02-02-99	20 MHz	2.0 GHz
ANTENNA MAST	Custom Made	None	N/A	N/A	N/A
TURNTABLE	EMCO	1060	N/A	N/A	N/A
BOTH TEST SITES					
25.0 dB Preamplifier	Hewlett Packard	8447D	01-10-99	100 kHz	1.3 GHz
26.5 dB Preamplifier	Hewlett Packard	8449B	01-10-99	1 GHz	26.5 GHz
Horn Antenna	Spectrum Technologies	DRH-0118	02-26-99	1 GHz	18 GHz
Active Loop Antenna	EMCO	6502	05-07-99	10 kHz	30 MHz

(iv) RADIATED EMISSIONS DATA

Test Date : May 21, 1998
Test Performed : Radiated Emissions
Limit Values : FCC Class B (3-meters)
Test Distance : 3 Meters

EUT DESCRIPTION	ENVIRONMENTAL CONDITIONS
(1) Centron RMR Electricity Meter	Barometric Pressure : 29.71 mmHg
(2) EUT S/N: 14915930	Temperature : 32 °C
(3) Normal Transmitting Mode	Relative Humidity : 44 %

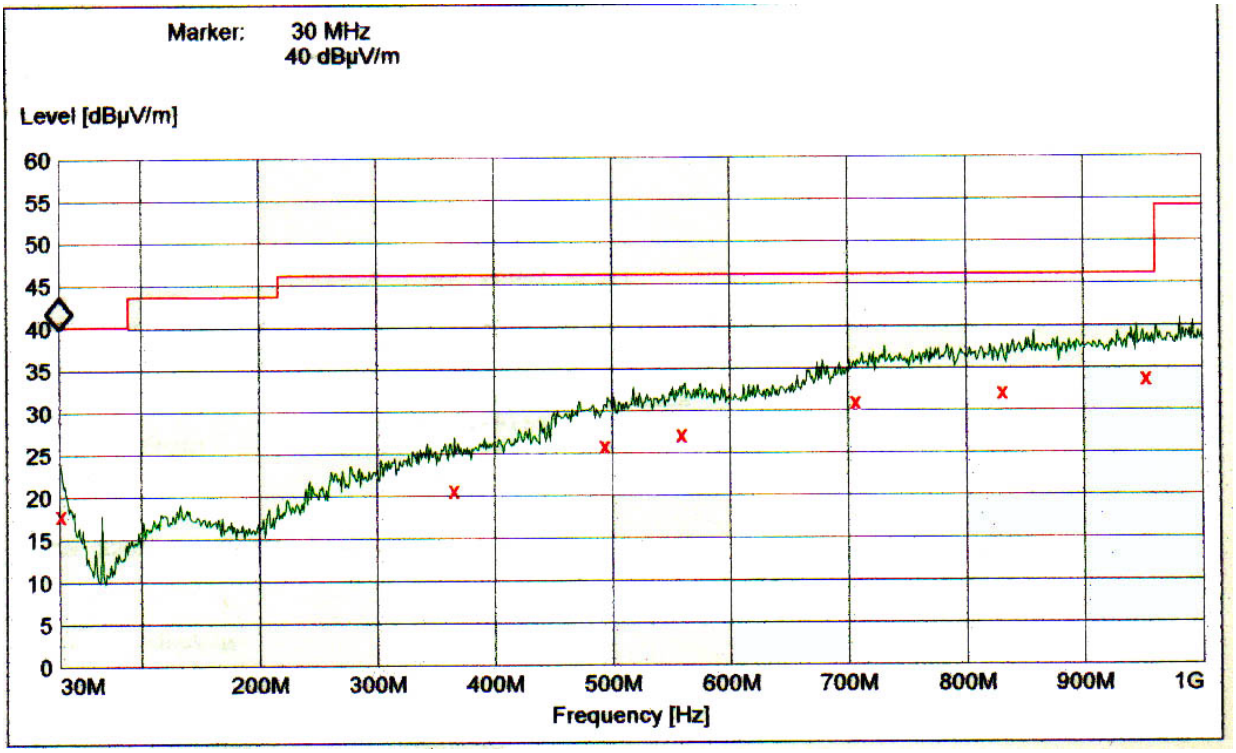
3-meter Semi-Anecohic Chamber Data

Frequency (MHz)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin Limit - Amplitude (dB)	Table Azimuth (Degrees)	Antenna Height (Meters)	Antenna Polarization (V / H)
30.56	***17.8***	***40.0***	***22.2***	***72***	***1.24***	***H***
364.80	20.6	46.0	25.4	0	2.77	H
492.80	25.8	46.0	20.2	248	2.27	H
558.08	27.1	46.0	18.9	22	3.03	V
705.60	30.9	46.0	15.1	353	3.30	H
830.00	32.0	46.0	14.0	280	2.91	V
951.76	33.6	46.0	12.4	83	1.77	V

10-meter Open Area Test Site Data (NOT USED FOR THIS EUT)

Frequency (MHz)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin Limit - Amplitude (dB)	Table Azimuth (Degrees)	Antenna Height (Meters)	Antenna Polarization (V / H)

(v) Unintentional Radiated Electric-Field Emissions - Graph



Green Line: Peak Values **Red X: CISPR Values**

(d) Microwave Radiated Emissions

(i) Test Site Used

The microwave radiated electromagnetic emission amplitudes, between 900 MHz and 10 GHz, were acquired with the EUT setup on the CTL OATS. At frequencies where ambient noise levels prevented accurate data acquisition on the CTL OATS, the measurements were acquired in the three-meter semi-anechoic chamber.

(ii) Special Test Equipment Used

Special test equipment used to acquire the test data is given below. Please refer to the table in Section 6.3.2 for more detailed information.

- For frequencies between 1GHz and 18GHz, the Spectrum Technologies Horn Antenna was used.
- For frequencies above 1GHz, the HP 8449B preamplifier was used.

(iii) Test Procedure

The EUT was setup on a RF transparent table that rests on an EMCO turntable capable of rotating the EUT from 0 to 360 degrees. Cables were oriented to maximize the field strength amplitudes. The receiving antenna was set to fixed height of 1-meter during the test (line of sight). The test distance on the OATS and in the semi-anechoic chamber was three meters. Measurements were manually acquired via the following test procedure:

(1) To facilitate easier and more accurate data acquisition, modify the EUT so that it transmits continuously.
(2) Determine the fundamental frequency, and the first nine harmonics, of the intentionally transmitted signal (it is assumed that the fundamental frequency is also the first harmonic).
(3) Tune the receiver to the frequency of interest;
  (a) Setup measurement instrumentation in proper measurement mode;
  (b) Place the antenna in the horizontal position;
  (c) Rotate EUT and record the maximum emission level detected, antenna height, antenna polarization, and turntable angle;
  (d) Place the antenna in the vertical position and repeat step (c);
  (e) Return to step (3) and repeat for each harmonic of interest;
  (f) Create a report presenting the test results;

(iv) Calculations

The calculation process for intentional microwave radiated emissions is as indicated below.

The microwave emissions were measured in power (dBm) rather than field strength (dBuV). The dBm power reading for the EUT described is converted to dBuV by adding a conversion factor of 76.3 (in a 50-Σ measurement system).

- **Conversion Factor $V_{dB\mu V}$ to P_{dBm}**

(1) P_1 = reference power (watts); P_2 = measured power (watts);
(2) [by definition] Bel = $B = \text{Log}(P_2 / P_1)$;
(3) [by definition] $dB = 10 \text{ Log } (P_2 / P_1)$;
(4) [use $P = V^2/Z$ relationship] $dB = 20 \text{ Log } (V_2 / V_1) + 10 \text{ Log}(Z_1 / Z_2)$;
(5) [where $Z_1 = Z_2$] $dB = 20 \text{ Log } (V_2/V_1)$;
(6) [reference = 1 Volt] $dBV = 20 \text{ Log } (V_2)$;

dBm = decibels above one mW

(7) [Using Equation (6) above] $V_{dB\mu V} = 90 + P_{dBm} + 10 \text{ Log}_{10}(Z)$;
(8) [For Z = 50-Σ] $V_{dB\mu V} = 107 + P_{dBm}$

- **Duty Cycle Correction**

(9) Time Slot : 100ms
(10) Message Duration : (96 data bits / message) (1/16384 sec / data bit)
(11) = 5.859 ms / message
(12) Actual Transmit Time : (message duration) / 2 = 2.93 ms / message
(13) Percent Duty Cycle : [(Transmit Time) / 100ms)] (100) = 2.93 %
(14) **Voltage Correction : 20 Log10 (Duty Cycle) = 30.7 dB**

- **Conversion Factor $V_{dB\mu V}$ to P_{dBm} After Compensating for Duty Cycle**

(15) [Using Equation (8) and Correction (14)] **$V_{dB\mu V} = 76.3 + P_{dBm}$**

- **FCC Limit Correction via 47 CFR 15.249**

(16) 47 CFR 15.249(a) Limit = 500 µV/m
(17) [Convert to dBµV using equation (6)] : $dB\mu V = 20 \text{ Log}_{10} (500) = 53.98$
(18) 47 CFR 15.249(d) Peak Correction = + 20dB
(19) Corrected FCC Limit = 73.98 or **74.0 dBµV**

Equation (15) and Limit (19) given above are used to determine compliance as given below:

(1) Margin (dBuV/m) = Applicable Limit (dBuV) - Field Strength (dBuV/m)

(2) Field Strength (dBuV/m) = Meter Reading (dBm) + 76.3 + Loss (dB) - Gain (dB)
- Loss = Cable Loss (dB) + Antenna Factor (dB) + Attenuation (dB)
- Gain = Amplifier Gain (dB)

EXAMPLE CALCULATION

Frequency: 2.0 GHz

- Meter Reading = -47 (dBm)
- Cable Loss = 15 (dB)
- Antenna Factor = 16 (dB)
- Attenuation = 0 (dB) [no attenuator external to receiver]
- Amplifier Gain = 26.5 (dB) [preamplifier in signal path]
- Applicable Limit = 74 (dBuV/m)

Margin (dB) = 74 (dB) - [-47 (dBm) + 76.3 + 15 (dB) +16 (dB) - 26.5 (dB)] = 40.2 dB

(v) Microwave Radiated Emissions Data

Test Date : May 21, 1998
Test Performed : Radiated Emissions
Limit Values : 47 CFR §15.249(a) - (d)
Test Distance : 3 Meters

EUT DESCRIPTION	ENVIRONMENTAL CONDITIONS
(1) Centron RMR Electricity Meter	Barometric Pressure : 29.71 mmHg
(2) EUT S/N: 14915930	Temperature : 32 °C
(3) Normal Transmitting Mode	Relative Humidity : 44 %

Fundamental Tx Frequency (F_0) = 915.00MHz

Harmonic	Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Amp. Gain (dB)	Corrected Reading (dBuV/m	FCC Limit (dBuV/m)	Margin y Limit - CR (dB)	Antenna Polarity (H / V)
1(F_0)	915	59.9	22.9	7.2	0.0	90.0	94.0	4.0	V

Harmonics

Harmonic	Frequency (MHz)	Reading (dBm)	Conversion Factor (dBm to dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Amp. Gain (dB)	Corrected Reading (dBuV/m	FCC Limit (dBuV/m)	Margin (dB)	Antenna Polarity (H / V)
2(F_0)	1,830	-52.2	76.3	29.0	11.5	26.8	37.8	74.0	36.2	V
3(F_0)	2,745	-62.9	76.3	31.7	14.8	26.5	33.4	74.0	40.6	V
4(F_0)	3,660	-65.7	76.3	34.0	17.3	26.4	35.5	74.0	38.5	V
5(F_0)	4,575	-67.0	76.3	34.2	19.0	26.2	36.3	74.0	37.7	V
6(F_0)	5,490	----	----	36.3	24.2	26.0	----	74.0	----	----
7(F_0)	6,405	----	----	38.0	26.9	26.1	----	74.0	----	----
8(F_0)	7,320	----	----	39.6	29.8	26.4	----	74.0	----	----
9(F_0)	8,235	----	----	39.6	32.2	26.3	----	74.0	----	----
10(F_0)	9,150	----	----	40.7	36.2	26.1	----	74.0	----	----
11(F_0)	10,065	----	----	----	----	----	----	74.0	----	----

- : 1(F_0) measurement made using the CISPR Quasi-Peak detection mode; BiLog Antenna
- : 2(F_0) through 5(F_0) measurement made using PEAK detection mode; Horn Antenna

- : Due to Ambient Noise, 5(F_0) measurement made in 3-meter semi-anechoic chamber.